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ABSTRACT

Policy issues and their implications in the introduction of computer technology in the Northwest and Pacific schools are examined. Eight issues, focused on instructional uses of computer technology, are covered. (1) Establishing an overall state education agency (SEA) position will set the tone for statewide development of instructional technology. (2) The SEAs must select appropriate roles and develop clear and specific state level educational policies for leadership in instructional technology. (3) The computer poses special problems in equity and access, an important policy issue that requires thoughtful development to redress existing inequities and ensure fairness. (4) Because technology may embody potential threats to present values, it is important to formulate policies that fit our cultural and moral values. (5) Policies may need to be more clearly stated so that the use of instructional technology is compatible with basic educational goals. (6) It is important that SEAs collaborate with local school boards, other state agencies, business and industry, and higher education. (7) Computer technology has potential to save money and help schools cope with declining resources. (8) SEA instructional technology policy must be based on three commitments: to serious long-range planning; to extensive staff development; and to responsible resource allocation. (MD)

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INSTRUCTIONAL TECHNOLOGY: POLICY ISSUES FOR STATE EDUCATION AGENCIES

An Issues Analysis Paper

Discussion Draft

Prepared for the Chief State School Officers
of the Northwest and Pacific

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Introduction

In making bold and constructive response to the challenges of this fast developing "Age of Technology," as it is popularly called, State Education Agencies are faced with some complex educational policy issues. This report--suggested by the Chief State School Officers of the Northwest and Pacific, and based largely on information obtained and questions raised during recent onsite visits with these persons and key members of their staffs--will consider some of the policy issues which have been identified by these informants, and derived from other sources. The policy issues and some of their implications will be examined, but specific policy options will not, at this time, be set forth. So many of the policy issues are new, ones which will take SEAs into relatively uncharted areas, that trying now to spell out specific policy options, with analysis of their probable consequences, would seem to be premature.

The policy issues, however, are beginning to emerge quite clearly. Those most frequently mentioned by Chiefs and their staff members during the recent onsite visits included these:

1. Establishing an overall SEA stance or position
2. Selecting appropriate SEA roles
3. Providing for equity and access
4. Safeguarding educational values
5. Addressing instructional concerns
6. Collaborating with other agencies
7. Using the technology to cope with declining resources
8. Developing overarching educational policies

Reasonably brief consideration of these eight issues demands that some narrowing of focus be brought to an otherwise almost unmanageable task. For example, this issue analysis paper will be primarily concerned with instructional (rather than administrative or managerial) uses of technology, though the line between these types of uses is often blurred, as in the instructional/management employment of the computer for evaluation of student progress, for record-keeping and reporting, and for detailed planning of instructional programs.

Likewise, while it is impossible to consider fairly the instructional uses of technology without also giving some attention to the impact of technology on society as a whole, the focus of this paper will preclude more than brief consideration of how the increasingly technological society may affect education directly and indirectly. The availability of satellite communication, for example, has a direct bearing on war and peace and international relations, and thus on the future of education, but examining the complexity of this web of interrelationships is beyond the scope of this analysis. Any technological advancement begets societal change, and these political, economic, familial, and occupational changes are bound to affect the schools--but these broader changes and influences are not our concern at the moment.

On the other hand, it is necessary to broaden, rather than to narrow, our focus in some respects. Despite the popular notion that instructional technology is now synonymous with computers, educational policymakers know--and must continue to reiterate--that there is a whole range of alternative mechanisms and devices available to us as we attempt to improve instruction through the judicious use of electronic technologies: instructional television (particularly appropriate and

usable now with the common availability of satellite broadcast, videodiscs and videotapes); telecommunications and teleconferencing; the electronic mail drop; and--still important--some of the more traditional audiovisual devices. The computer, it is true, is the newest, perhaps the most potentially useful, and certainly the most exciting development yet in the electronic instructional arena, but it may well have its highest and best use in conjunction with other, less glamorous devices.

One final aim of this issues analysis paper must be mentioned: it will attempt to avoid the extreme views often represented by the overly enthusiastic proponents and the overly suspicious critics of the newer instructional technologies. For example, there are those who see the new developments and devices as <u>the</u> answer to all instructional problems, only to meet with the foot dragging response that the "new stuff"--computers, most particularly--will lead only to the disappointments previously experienced with nearly every other educational innovation, from classroom use of radio to teaching machines to PPBS and MBO! The policy issues to be described below will be addressed with as much objectivity as possible, avoiding both some of the cliches and wild guesses that have turned the over zealous proponents into such bores, and the unthinking suspicion that sees every innovation as a predictable failure. Rather, the policy issues will be put into a reasoned and reasonable perspective, embodying the balance which seems to be needed as we move into what is perhaps not a new <u>era</u> in education, but certainly a new <u>dimension</u> of education.

The Eight Issues

1. ESTABLISHING AN OVERALL SEA STANCE

What is called here the "stance" of the SEA is not generally a matter of overtly stated departmental policy; rather, it is the overall position which the agency sees itself taking, and the one which is perceived as such by those outside the department. Thus, establishing the general stance of the SEA with respect to instructional technology does not necessarily call for a formally adopted policy statement, at least initially. In fact, it may be well to avoid a too early, too specific overt policy statement until some of the operating problems have fallen into place.

Acceptance, advocacy, anchoring. The SEA stance taken toward instructional technology may perhaps be seen as falling along a continuum ranging from forthright advocacy, to rather passive acceptance, to something which might be called an "anchor in the wind" position. Advocacy or acceptance are the more common and more comfortable positions, but there is some reason to believe that the SEA may on occasion have to try to slow things down a bit when the winds of change start blowing too fast! For example, when what one author calls "the high-tech rhetoric" gets overblown, when extravagant claims are made, when more is promised than can be delivered, or when impulsive hardware purchases outpace the availability of usable and appropriate software--in these instances, the SEA may have to caution greater moderation.

Multiple stances. Actually, along the continuum described, the SEA will most likely find itself taking multiple stances, for what is appropriate for the SEA to be doing is, of course, highly situational:

site-specific, time-specific, problem-specific. Thus the overall SEA stance will probably be one that is seen by the LEAs and the general public as one that is positive without being directive, clearly identifiable without being inflexible.

But the stance remains important: it sets the tone for statewide development of instructional technology; it underscores the department's leadership role; and it helps to determine, statewide, educational and fiscal priorities.

2. SELECTING APPROPRIATE SEA ROLES

Perhaps the single most important policy issues in instructional technology now emerging for SEAs is that of sorting out the specific roles the agency can most effectively play to make the great promises of the new technology become realities in classroom practice. As with all SEA activities, the problem is to choose not one overriding role, but a series of complementary and sometimes sequential leadership roles which do not diminish or denigrate local initiative, but which give the SEA the responsibility initially to do what the local and regional educational authorities are not yet able to do.

Information dissemination, technical assistance, fiscal support, regulation. The SEA roles in instructional technology, as accepted and reported by the states themselves, are therefore not unlike basic SEA activities generally: information dissemination, technical assistance, fiscal support, and reasonably required regulation. The information dissemination role is most influenced by several needs. First, the growing interest among school people in finding available high quality software has resulted in a flood of requests to SEAs. The Northwest

Regional Educational Laboratory's data base, "Resources in Computer Education (RICE)" is a major new development which SEAs are beginning to use to meet the information demand in an efficient manner. Several of the states in the Laboratory's region are also using their established dissemination networks to provide information on the quality of software and courseware from such efforts as NWREL's Microsift project.

Technical assistance by SEAs is near the top of the list of SEA functions, because it is in the activities commonly associated with this term--staff development, curriculum development, and improving instructional strategies--that most SEAs feel most comfortable--and most useful!

It is not surprising, then, that many SEAs have already instituted extensive training programs, including comprehensive training packages, to help local district personnel become more effective users of instructional technology, most especially computers. In the areas of curriculum and instruction, SEA activities lean heavily toward the development of computer laboratories and libraries, with strong emphasis on software evaluation.

The SEA role in fiscal support of electronic instructional technology has emerged less clearly, because of the vast differences in state fiscal policy and practice. Even more nebulous is the SEA regulatory role: should it set state priorities in the educational use of computers, for example? Should the state prescribe the kind of equipment to be purchased? Should it promulgate regulations for assuring equity and access for all students? Should it build computer literacy requirements into certification, accreditation and graduation standards?

Several states are exerting significant influence without mandates through taking an active role in hardware acquisition. For example, they negotiate discounts for volume purchases with certain vendors. The SEA then tells local districts that they can receive economies if they participate in this centralized purchase. Generally, the SEA also insures that staff development and support materials are also provided. In this way the SEA influences acquisitions of quality hardware and software.

Whatever the specific SEA roles are to be--as leader, regulator, or, as some maintain, just an impartial broker of ideas among interested educational entities--there will quite clearly be the need to select these roles and to develop clear and specific state level educational policies for state leadership in instructional technology.

3. PROVIDING FOR EQUITY AND ACCESS

One of the SEA roles noted in the section above is seen by many persons in the Northwest and Pacific region, as well as nationwide, to be of such signal importance that it becomes a policy issue in itself: providing for equity and access.

Instructional concerns per se, rather than equity concerns as such, have generally dominated the discussion of educational technology up until the introduction of the computer, for the other technological devices--if used at all--tended to be fairly readily available to nearly all students in nearly all schools. But the computer poses some very special problems.

Rich schools, poor schools. First of all, there is the problem of the "haves" and "have nots," both in the school and in the family settings. The more affluent the school, the better is the chance that it

will have computers early in the game and in more nearly ample numbers. Poor schools--that is, schools with fewer resources or in economically less favored areas--don't share equally. The home situation is much the same: only the middle-to-upper income homes will have computers available for their children.

Other limitations. There are other inequities of access to computers for instruction--gender, for one. It was not surprising, therefore, that since math/science is too often considered to be a "male" interest, an early study reported two-thirds of all computer users in education were reported to be male, even though more than 50 percent of all students were female.

The recent rapid courseware developments in other subject areas may alleviate this problem somewhat. But there is a broader issue and that is the need to assist girls in studying about the computer and to see computer careers as an option for girls as well as boys. For it is this area that has caused the greatest difficulty in ensuring equity.

There are two more indications of inequities in access to computers in schools, both tied to the inequities mentioned above. Even those schools in poorer districts which do have computers use them almost exclusively for routine drill. This "drill and practice" function is an important use of the computer. However, if this is the sole use, disadvantaged students never experience opportunities to learn about computers and computer careers. The issue here is one of achieving an appropriate balance between teaching with the computer and teaching about the computer.

It seems clear that there are unresolved problems, serious and even potentially dangerous to society, in the lack of fair and equitable availability of those experiences in a time when "knowing how to use computers" is held to be, rightly or wrongly, an essential background for success in later life.

These issues, therefore, would seem to require the thoughtful development of specific SEA policies calculated to redress the present inequities and insure a fairer chance for all students to profit from learning experiences both about and through computers.

4. SAFEGUARDING EDUCATIONAL VALUES

Technology in education, like technology in our society as a whole, offers almost infinite possibilities for advancing human welfare, but may embody also some potential threats to established values. Technology, some fear, can lead to excessive materialism, mechanization and depersonalization. For example, it is often feared that students excessively dependent upon a machine for learning will lack sufficient contact and interaction with real, live teachers; that the student is really being programmed by the machine--that he learns only what the machine is set up to teach him, in the sequence determined by the machine. Again, the issue is one of achieving balance between using the computer in a "programmed" instruction mode on the one hand as well as giving students opportunities to manipulate the computer. Perhaps even more troublesome is the possibility that the student, working in what is almost inevitably a one-to-one relationship with the mechanical device will lose out on the intellectual, social and emotional stimulation that comes from participating in a learning group.

Moreover, as Michael Kirst has recently pointed out, the "high-tech" emphasis that is being so strongly urged in education overlooks, if it does not actually deny, other very basic concerns of our society. As he puts it, "The 'high-tech' courses that really need to be taught are those that help students sort out the moral and social implications of the nation's increasing use of technology."

Perhaps these concerns are overstated; perhaps these feelings of uneasiness with the new technology will disappear when that which is now novel and even threatening becomes more familiar to us all. Nevertheless, there does seem to be reason to believe that these are at the moment issues which will be of policy concern to educational decision makers at the state level. At the very least, there would seem to be need for the formulation of policy statements which recognize that every step in the introduction and use of instructional technologies must take place within an ideological framework which can gain the support of parents and the community at large. It may be important to emphasize that as state policy, the instructional uses of the mechanical devices, the selection of the software and necessary support materials, and the relative place given to the newer instructional devices and methodologies in the school program will continue to safeguard the personal, social, cultural and moral values that represent the highest ideals cherished in American society and American education.

The specific policies needed may not yet be known, but the issues involved are clearly of major importance.

5. ADDRESSING INSTRUCTIONAL CONCERNS

Precisely how the newer instructional technologies, and most particularly the computer, will be employed in the classroom embody essentially procedural questions of a technical and professional nature which are not in themselves necessarily policy issues. But there are emerging a number of instructional concerns which transcend the how-to-do-it techniques and are becoming matters on which clear educational policy needs to be established.

Higher level learning. The instructional question of most pressing concern is that of placing much greater emphasis on the development of the higher level cognitive skills, as opposed to those learnings which are essentially matters of recall taught through drill, practice and review. The routineness--even almost stultifying barrenness--of much computer-assisted instruction is a matter of despair among educators in this region and throughout the country. On the other hand, the computer can be a tool to relieve the teacher of mundane instructional tasks.

Doubtless the description of most software programs used in the classroom which dismisses them as merely "computerized workbooks" or "electronic flashcards" represents an overly harsh judgment. But the problem of moving beyond those skill teachings which the computer may do exceedingly well into more sophisticated, higher order instruction is a very real one. Policies may need to be articulated which emphasize clearly that the higher cognitive skills are considered of preeminent importance, and that instruction which stops short of these higher levels will not meet state approval standards. Again the policy issue is one of achieving balance use between drill and practice and problem solving and other higher level thinking.

Evaluation. Evaluation of instructional technologies, both hardware and software, will doubtless become an educational policy concern, not only to preserve and enhance the integrity of instructional efforts, but simply to provide an elemental form of consumer protection--assuring that schools and children don't get ripped off by shoddy or inappropriate commercial products. Policies will probably be needed which require second- and third-party evaluations, preferably by involvement of fairly large numbers of knowledgeable persons brought together in cooperative "networks" and "consortia" such as those in use in several states and in NWREL's "Microsift" project.

Instructional design. The actual instructional design of programs intended for use in classrooms is considered of very high importance by state education officials concerned with instructional technology. In fact, one of the persons with whom we consulted suggested that we should "hammer on" the SEA responsibility for establishing policies which would unfailingly provide for SEA review of the instructional design of all such programs, especially those involving the use of computers.

Frivolous or unproductive use. Because a number of the uses of computers in education are simply entertaining or handy, there seems to be a growing sense that the school computer is too often put to frivolous or unproductive uses--playing games, drawing pictures, producing graphic designs, or for purposes which accrue to the private advantage of individuals or associations. General policy guidelines may be needed which will promote the "keep it instructional" emphasis, without wholly excluding, on a very limited basis, more casual uses.

"A static medium." Several knowledgeable educational leaders at the state level have commented that most of the instructional technology materials once acquired--films, videotapes, videocassettes and commercial computer programs, for examples--tend to be used over a very considerable period of time and cannot be easily changed. Put briefly, you're stuck with what you buy. To assure maximum medium-to-long-range utility of these materials, therefore, policies specifying purchasing procedures involving very carefully formulated specifications and selection processes may well be required.

Instructional technology and agency goals. In a number of the states visited, serious concern was expressed regarding an unintended gap that is appearing between the uses to which instructional technology is sometimes being put and the basic goals of the SEA. For example, does the increased use of computer-assisted or computer-managed instruction really jibe with the goals of the effective schools movement or the quest for quality which is beginning to drive the entire state education program? What is happening to time on task, to direct instruction, to the broad competency areas which states have identified? If providing for the best possible education of the handicapped remains a high priority state goal, as every state proclaims, are the newer technological devices and approaches made equally available for appropriate use by this group of students?

Raising these questions does not imply at all that the use of instructional technology is in any way incompatible with the achievement of basic state educational goals, but it is evident that there is some uneasiness about whether policies may need to be more clearly stated so that the drive toward greater use of technology does not derail efforts to accomplish fundamental state educational objectives.

6. COLLABORATING WITH OTHER AGENCIES

While the focus of this paper is largely on instructional uses of technology, at the present time most SEA collaboration with other agencies has focused on management issues. This collaboration with other agencies takes three general forms:

1. Collaboration between SEAs and LEAs
2. Collaboration between SEAs and other state agencies
3. Collaboration between SEAs and business and industry

The major developments regarding collaboration between SEAs and these agencies are outlined below.

SEA/LEA Collaboration. Today, all but the smallest school districts rely on computers to help meet their management needs. At the same time, SEAs also rely on the power of computers for many of their management, budgetary and other needs. It is only a short step to link these computers through Electronic Mail Systems, or similar methods, to simplify the transmission of data between the state and the local school districts.

The value of this type of communication would be the simplification of reporting requirements, making it possible for LEAs to submit required state reports via magnetic tape, reducing the need for local districts to fill out complex forms, and for the state to keypunch all data received. All that would be required is the establishment of standard reporting formats so that the computers at the state and local level could communicate.

Another potential outgrowth of this type of collaboration between the state and local school districts might be a trend toward standardization of computing equipment, perhaps leading to state bids for computers, and the development of computing cooperatives within states.

The value of accurate and complete information about the financial condition of all school districts in a state was highlighted in California in the aftermath of Proposition 13's passage, where the quality of the California Department of Education's data is widely considered to have helped school districts garner a substantial share of the state bail-out funds.

SEA/State Agency Collaboration. Most SEA budgets are generally prepared using the same budget system utilized by all state agencies in their state. However, this is frequently the limit of collaboration between state agencies in the sharing of technology. Areas where states have begun to experiment with other forms of collaboration include sharing of data on children receiving services from more than one state agency, helping school districts count the number of disadvantaged children within their boundaries by making public assistance data available either to the SEA or the school districts themselves, and making computerized criminal records available to all public employers including education agencies. In Oregon, the Oregon Legislative Information Services makes the entire Oregon Revised Statutes, and all proposed legislation, accessible through terminal links with a central computer.

While this type of information sharing has tremendous potential for reducing much of the duplication in paper work that currently exists among public agencies, it is important that policy and legal guidelines be established to insure that confidential information is treated accordingly, and that the information is not misused as access to it increases.

Finally, as instruction in computer literacy becomes a more important part of the curriculum at both the elementary/secondary level and in higher education, it is important that SEAs maintain close contact with the higher education system in their states to insure that training at all levels is consistent and builds upon knowledge gained in the earlier grades. As states move to attract high technology industry, it is important that the schools collaborate to insure an adequate supply of potential employees for these new firms.

SEA/Private Industry Collaboration. Because of the specialized nature of many computer oriented careers, there appears to be great value in developing links between private industry and school systems. An aggressive posture on the part of the SEA to attract private firms to school/work programs would help local school districts find businesses that were interested in this type of collaboration. In addition, communications between educators and businessmen would help the education establishment understand the needs of industry and vice versa, making it easier for both groups to be responsive to the other in the development of new educational programs designed to meet the needs of new technology.

There is considerable evidence that firms making a decision about where to locate a new plant look closely at the quality of education in the community in which they want to build. Again, the SEA can play a major role in convincing private firms that the quality of education in their state will meet all expectations.

7. USING TECHNOLOGY TO COPE WITH DECLINING RESOURCES

SEAs are increasingly called upon to "do more with less" and to advise local schools how they can do the same. While all the evidence on cost savings from using computers is not in yet, computer technology has

strong potentials to cope with declining resources. Word processing applications have already demonstrated ways of increasing productivity. Certainly, automated accounting systems have demonstrated efficiencies over manual systems. Instructionally, uses of the computer can also help teachers enhance their productivity. These are but a few ways that technology can be seen as a tool to cope with the problem of declining resources.

8. DEVELOPING OVERARCHING POLICIES

Most of the policy issues identified in the preceding sections of this paper have dealt with fairly specific elements of the problems that are being encountered as we move into an increasing involvement with instructional technology. There are, however, some less tangible--but no less real--issues of broader nature which will probably have to be considered as SEAs develop and refine their overarching policies affecting instructional technologies.

Identifying the emerging nature of the American society. Popular myth has it that we are moving into a new age, the "technological age"; that we are becoming a "high-tech society"; that we are entering a "computer-oriented era"; that this is a "knowledge society" or an "information-based economy." All of these characterizations are partly true, but each of them presents a very limited view. The complexities of the American society and the American economy cannot be subsumed under any glib phrase. Thus, the schools will continue to serve the needs of a multifaceted society, with many different groups of clients having many different educational and vocational needs.

Therefore, we will need to prepare great numbers of school graduates to take their places in a high-tech society, great numbers who will work with the information and knowledge industries, but far greater numbers who will find their places in a service economy. Nearly ten times as many new jobs, according to Department of Labor statistics, will be available in the near future for janitors, nurses' aides, orderlies, fast food workers and kitchen helpers as for programmers and data processors. We will need great numbers of persons skilled in math and science, but far more whose life work will be enriched by the other traditional school subjects. Everyone will probably need some computer literacy, but a year-long course in computer science for high school graduation, as recently required by one Colorado school district, may be overkill.

Capitalizing on the social/political climate. Nevertheless, to get started and to make rapid advances in school use of instructional technology, we will need what the change-agent types call "a point of entry and leverage"--a selling point for the new educational enterprises and methodologies. The high-tech demands make one good starting place, as does the current high level of interest in math and science. The needs of special groups, such as the handicapped or those of limited English-speaking ability, can be partially addressed through instructional technology, as can the popular demands for "excellence," "equity," and "access." Whatever emphasis best serves to secure for instructional technology a broad-based popular and political support can legitimately be used as a focal point for the development of a comprehensive educational policy.

Allocating resources. Instructional technology may, in the long run, save money, but right now it is expensive both in start-up costs and recurring maintenance. Both the total resources for education within a state or district and the allocation of these resources among competing programs and goals are basically determined by forces outside of the educational system--legislatures and local taxpayers--and the fiscal prospects are spartan. With only 1 percent of current school funds typically spent for instructional materials, and only 1/2 percent for instructional equipment, recent statements that the cost of installing a complete computer lab in each school would cost "merely" 1/2 percent of the education budget can mean only one thing: something is going to have to give! Fewer library books? Fewer textbooks? Less science laboratory equipment or fewer art supplies? Maybe these would be wise decisions, maybe not; the point is that there will almost inevitably have to be clear-cut policies at the highest level indicating what priorities should be attached to educational expenditures and allocations.

Dividing responsibilities. One of the great strengths of the American system of education is also the cause of one of its most perplexing problems: how do you divide and share responsibilities in a highly decentralized system? In introducing or strengthening instructional technology systems, for example, should the SEA attempt to accept most or all of the initial financial risk and burden, just to get the ball rolling? Or, in trying to build a system free of redundancy and duplication, should the state centralize the system--or does centralization make the system vulnerable to (and hence hostage to) the failure of some single element or client of the system? These are typical of the policy questions that the SEA is likely to face as it seeks to preserve the values of state oversight coupled with local control.

An ultimate SEA policy? Probably there is no one policy or set of policies regarding instructional technology that would be applicable to every--or even to any--state, but there is one conclusion which derives very directly from beliefs expressed by the Chiefs of the Pacific and the Northwest, together with their senior staff members, as the onsite visits were being conducted. Not in just these words (for the points emphasized found expression in many different statements), but as an identifiable consensus there emerged a common belief that any SEA instructional technology policy must be based on three major commitments: to serious long-range planning; to extensive staff development activities at state and local levels; and to responsible resource allocation.

With acceptance of these commitments on the part of the SEA, the foundation for an overarching instructional materials technology policy would seem to be assured.

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